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(54) [Title of the Invention] PIPETTE CLEANER

(57) [Abstract]

[Object] To largely improve reliability of the accuracy of measurements by reliably preventing a pipette from cross-contamination by thoroughly cleaning the pipette, even when a viscous fluid such as the blood and thick reagent are adhered on the pipette.

[Construction] The pipette cleaner comprises a trough for filling cleaning water, a brush member disposed in the trough, a magnetic body attached at the bottom of the brush member, a rotary magnetic body disposed at the outside of the trough and having the same polarity as that of the polarity of the magnetic body attached to the brush member, and a driving means for rotating the rotary magnetic body.

[Claims]

[Claim 1] A pipette cleaner comprising a trough for filling cleaning water, a brush member disposed in the trough, a magnetic body attached at the bottom of the brush member, a rotary magnetic body disposed at the outside of the trough and having the same polarity as that of the polarity of the magnetic body attached to the brush member, and a driving means for rotating the rotary magnetic body.

[Brief Description of the Drawings]

[Fig. 1] Fig. 1 is a perspective view illustrating the construction of the pipette cleaner according to an embodiment of the invention.

[Reference Numerals]

- 1 pipette cleaner
- 2 trough
- 3 brush member
- 4 magnetic body
- 5 rotary magnetic body
- 6 motor
- P pipette

[Detailed Description of the Invention]

[0001]

[Technical Field of the Invention]

The present invention relates to a pipette cleaner for a sampling pipette and reagent pipette disposed in an

automatic analyzer for biochemical and immunochemical assay.

[0002]

[Description of the Related Arts and Problems to be Solved by the Invention]

It is well known that an automatic analyzer for biochemical and immunochemical assay is equipped with a pipetting unit such as a sampling pipette and reagent pipette. A given volume of a liquid is sucked from a vessel, and the sucked liquid is dispensed into another vessel using the pipetting unit. However, a pipette after sucking and dispensing the liquid should be cleaned for preventing the pipette from cross-contamination (contamination by residual reagents and samples), when different kinds of liquids are continuously sucked with one pipette as in an automatic analyzer.

[0003]

However, the pipette is cleaned by flowing cleaning water in the pipette and on the outer surface of the pipette in most of usual pipette cleaners. The pipette cannot be completely prevented from cross-contamination due to the presence of remaining contaminants after cleaning by the simple method as described above, when a viscous liquid such as the blood or a thick reagent is adhered on the pipette. This may be a cause for impairing reliability of the accuracy of measurements.

[0004]

The object of the invention devised by taking the current state above into consideration is to provide a pipette cleaner that is able to largely improve reliability of the accuracy of measurements, whereby the pipette can be reliably prevented from cross-contamination by thorough cleaning even when a viscous liquid such as the blood or a thick reagent is adhered on the pipette.

[0005]

[Means for Solving the Problems]

The invention for attaining the objects above provides a pipette cleaner comprising a trough for filling cleaning water, a brush member disposed in the trough, a magnetic body attached at the bottom of the brush member, a rotary magnetic body disposed at the outside of the trough and having the same polarity as that of the polarity of the magnetic body attached to the brush member, and a driving means for rotating the rotary magnetic body.

[0006]

[Embodiment]

The invention will be described in detail hereinafter with reference to an embodiment shown in the attached drawing.

[0007]

As shown in Fig. 1, the pipette cleaner 1 in this embodiment comprises a trough 2 for filling cleaning water, a brush member 3 disposed in the trough 2, a magnetic body 4 attached at the bottom of the brush member 3, a rotary magnetic body 5 disposed at the outside of the trough 2 and having the same polarity as that of the polarity of the magnetic body 4, and a driving motor 6 for rotating the rotary magnetic body 5.

[0008]

The trough 2 is disposed at a halfway position for transferring the pipette P from a vessel to another vessel, although the position is not shown in the drawing. The pure cleaning water is always injected into the trough 2, and contaminated water after cleaning is continuously drained from the trough 2.

[0009]

The brush member 3 is formed into a cylinder with a lightweight synthetic resin, and is secured on the magnetic body 4 so that tips of bristles of the brush are extended in the center direction.

[0010]

The magnetic body 4 is made of a circular disk of a permanent magnet, and S-poles and N-poles are alternately aligned in the direction along the circumference of the magnet.

[0011]

The rotary magnetic body 5 is also made of a circular disk of a permanent magnet, and S-poles and N-poles are alternately aligned in the direction along the circumference of the magnet. The S-poles and N-poles are aligned so as to form the same magnetic field as the magnetic poles of the magnetic body 4. The magnetic body 4 comprising the brush member 3 attached thereon usually floats in cleaning water in the trough 2 by a repulsion force between the magnetic body 4 and rotary magnetic body 5.

[0012]

The motor 6 is provided for rotating the rotary magnetic body 5 to a given direction. The magnetic body 4 is rotated in cleaning water by the rotation of the rotating magnetic body 5. The brush cleans the outer circumference face of the pipette P inserted in the brush member 3 with rubbing while the brush member 3 is rotating, and the inner circumference face of the pipette is cleaned by feeding cleaning water (not shown). Accordingly, the pipette P is cleaned with rubbing to an extent capable of avoiding cross contamination from occurring.

[0013]

Since the brush member 3 is left behind by being immersed in cleaning water, contaminants adhered on the brush member 3 is spontaneously washed away by the stream

of cleaning water. Consequently, the pipette P can be always cleaned with the clean brush without providing any separate units for cleaning the brush member 3. Naturally, the brush member 3 may be cleaned by always permitting the rotary magnetic body 5 to rotate in order to clean the brush member while it is immersed in cleaning water, for further improving the cleaning efficiency of the brush member 3.

[0014]

[Advantages]

As described above, the brush member for cleaning the outer circumference face of the pipette with rubbing is floated while being immersed in cleaning water, and the brush member is rotated by taking advantage of a magnetic force in the pipette cleaner according to the invention. Accordingly, the drainage is quite simplified while reliably preventing the pipette from cross-contamination by thorough cleaning even when a viscous liquid such as the blood and thick reagent are adhered on the pipette. Accordingly, the invention can exert an excellent effect for largely improving reliability of the accuracy of measurements.

Fig. 1

